

LDC Amendment Request

ORIGIN: Growth Management Department

AUTHOR: Growth Management Department Staff

DEPARTMENT: Growth Management

AMENDMENT CYCLE: 2016 LDC Amendment Cycle

LDC SECTION(S): 6.05.01 Water Management Requirements

6.05.03 Stormwater Plans for Single-Family Dwelling Units, Two-Family Dwelling Units, and Duplexes (new section)

CHANGES: This amendment expands the requirement for a stormwater plan for all new buildings, additions, or redevelopment of single-family dwellings, two-family dwellings, and duplexes. Currently, only those lots that exceed the maximum lot coverage or impervious area are required to submit a stormwater plan. This amendment removes the maximum lot coverage, requires a stormwater plan on all lots and increases the impervious area thresholds for when an engineered plan is required. Exceptions to the requirement for stormwater plans are provided for lots in the Rural Agricultural (A) zoning district that are outside the coastal urban area and Immokalee urban area, and for lots within a project that has been permitted by the South Florida Water Management District (SFWMD) for Surface Water Management or Environmental Resource Protection.

The amendment establishes two types of stormwater plans as described in Tables 1 and 2 below:

Table 1. Type I Stormwater Plans.

Required for:	Type I Stormwater Plans shall demonstrate:
Lots with 40 percent or less impervious area.	1. The direction of stormwater discharges. 2. Compliance with design standards for retaining walls, French drains, stormwater pipes, gutters and downspouts. 3. The location, dimension, and setbacks of septic systems, if applicable.
Lots in the Estates district with 25 percent or less impervious area.	
Lots in RSF-1 or Rural Agricultural (A) districts in the urban area with 30 percent or less impervious area.	
Lots that discharge directly into a waterbody that is downstream of the last control structure (regardless of impervious area).	

Table 2. Type II Stormwater Plans.

Required for:	Type II Stormwater Plans shall demonstrate:
Lots with more than 40 percent impervious area.	1. Compliance with all Type I Stormwater Plan criteria. 2. Water quantity calculations to accommodate the runoff from the area exceeding the Type II Stormwater Plan thresholds from a 5-year 1-day storm. 3. A matrix of all required separation distances between wells, drainfield systems, and stormwater retention/detention areas. 4. Certification of compliance by the engineer.
Lots in the Estates district with more than 25 percent impervious area.	
Lots in RSF-1 or Rural Agricultural (A) districts in the urban area with more than 30 percent impervious area.	
Lots that discharge directly into a waterbody that is upstream of the last control structure (regardless of impervious area).	

Additionally, the amendment establishes Type I and Type II Stormwater Plans as the tool for demonstrating compliance with Collier County Code of Laws and Ordinances section 90-41 (f)(8).

A new application process for stormwater plans is also established in the Administrative Code.

REASON:

History

The current standards in LDC section 6.05.01 F were created in 2007 to address impacts associated with large homes on small lots in conventional zoning districts. At that time, it was determined that lots exempt from obtaining a SFWMD permit were designed to accommodate a typical amount of lot coverage or impervious area. Therefore, it was determined that when a large home exceeds the typical lot coverage or impervious area for that neighborhood, the home may result in impacts to neighboring properties or the local stormwater system. As a result, a requirement to provide a stormwater plan was established to address stormwater runoff from lots with a greater than average percentage of lot coverage or impervious area.

In 2013, the Development Services Advisory Committee (DSAC) reviewed the stormwater plan requirements in this section. At that time, they identified that the maximum lot coverage and impervious areas are disproportionately limiting on Estates lots and recommended that an LDC amendment address the lot coverage and impervious area thresholds. The amendment was then added to the prioritized list of LDC amendments and approved by the Board of County Commissioners. Following DSAC's discussion of these standards, staff conducted additional research and found several other areas for improvement in the current program as described in the following sections.

Staff Research

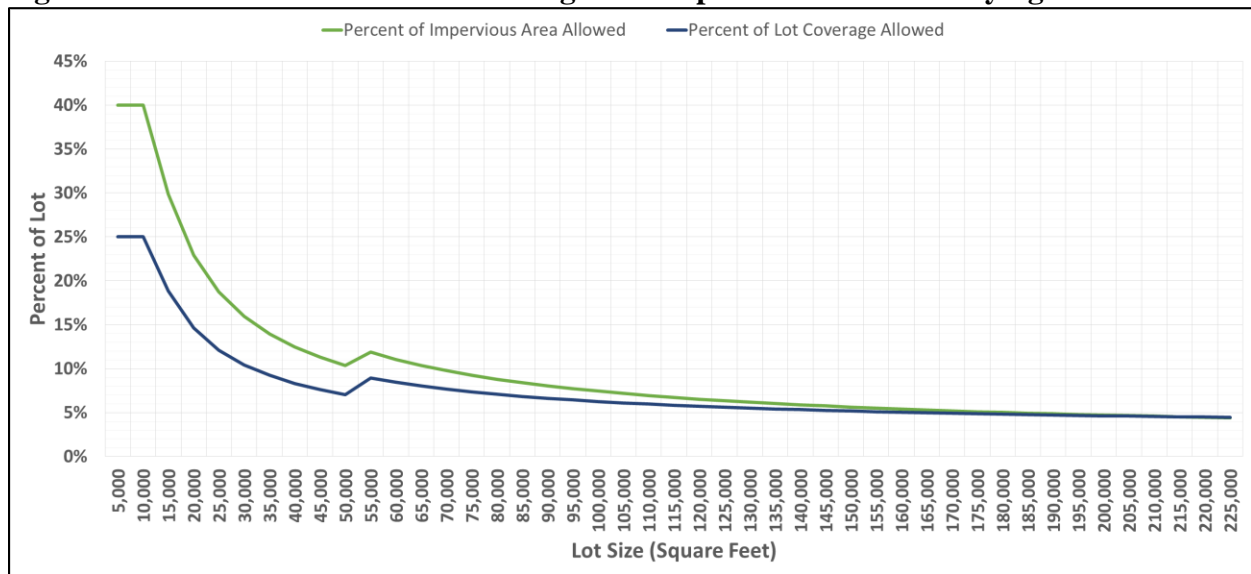
Staff analyzed data from lot coverage reviews that occurred during a one-year period from June 2015 to June 2016. Staff members who regularly perform lot coverage reviews also identified common problems with stormwater plan submittals and the current standards. As a result, staff has

proposed changes to address not only disparities in the current thresholds, but also to resolve several issues related to other elements of stormwater plans:

Thresholds

Analysis of the current thresholds confirmed that the maximum lot coverage and maximum impervious area percentages do not apply consistently as lot sizes increase. Additionally, this analysis has demonstrated that the percentage of lot coverage/impervious area allowed is inconsistent once lot sizes exceed 53,000 square feet. Figure 1 demonstrates how the allowed lot coverage and impervious areas change as lot sizes increase. For small lots, the maximum allowed lot coverage begins at 25 percent and the maximum allowed impervious area begins at 40 percent. However, larger lots are limited to a maximum lot coverage and impervious area of less than 5 percent.

Figure 1. Percent of Allowed Lot Coverage and Impervious Area at Varying Lot Sizes.



Common problems

LDC section 6.05.01 F is intended to address impacts associated with stormwater runoff flowing onto neighboring properties. However, the current standards do not adequately protect against the possibility for stormwater impacts. For properties that do not exceed the existing thresholds, no review is performed when improvements are made to the property to ensure stormwater does not flow to neighboring properties. However, even lots with a low percentage of lot coverage and impervious area have the potential to impact their neighbors through site grading changes, slopes or new structures near the property line, and other site features.

For lots that exceed the existing lot coverage or impervious area thresholds, while retention or detention of stormwater is required, the current standards still do not adequately protect against the possibility for stormwater impacts. There are no criteria related to berms or slopes near the impacted area and there is no requirement for runoff to physically connect to the retention area. This means that although a retention area may be provided, there is no guarantee that the retention captures any of the runoff from impervious areas on site or that other site features won't result in a change in flow patterns and create stormwater impacts on neighboring properties.

Moreover, there are some types of impervious surfaces that are not required to obtain a permit and therefore may not be counted toward the maximum impervious area. However, any impervious surfaces still have the potential to change stormwater runoff patterns.

Exemptions

Several exemptions are provided in the current standards. One of these allows an additional 3 percent (up to a maximum of 1,000 square feet) lot coverage or impervious area for first time additions only. However, this additional lot coverage is not exempt during subsequent additions. This means that if a stormwater plan is required for future additions, retention will then be required for the area that was previously exempt from the standards.

Another exemption applied to lot coverage and impervious area reviews is for additions less than 400 square feet. Additions less than 400 square feet are not reviewed, even when the maximum lot coverage or impervious area has already been exceeded. The nexus for both of these exemptions is not clear and they could allow for stormwater impacts to occur, therefore, there are no size exemptions in the proposed amendment.

Approval process

Lot coverage and impervious area calculations are currently only required when on site retention is required. As a result, property owners submitting a building permit may not be aware how much impervious area is on their lot until they have exceeded the thresholds. This can make thoughtful planning of the lot difficult for property owners. This difficulty is compounded when separate permits for a home and pool are submitted simultaneously. In some cases, one permit may indicate a stormwater plan is required, while the other does not. This can be confusing for property owners and again makes planning the development of the lot unpredictable. With this in mind, staff believes the current process does not effectively communicate stormwater plan requirements to property owners. For these reasons, the proposed amendment more clearly defines when stormwater plans are required, how they should be prepared, and other procedural considerations. The new Administrative Code section proposed in Appendix A is also intended to more clearly define the approval process for stormwater plans.

Other communities

Staff reviewed lot coverage and stormwater management requirements for single-family dwellings, two-family dwellings, and duplexes in 15 other communities and municipalities throughout Florida. Three characteristics of stormwater management were common in other communities:

1. Maximum lot coverage percentages and stormwater management applicability is based on zoning districts, rather than lot sizes, in nearly all communities reviewed.
2. When stormwater management is required, standards are established for all lots, rather than just those exceeding the maximum percentage of lot coverage or impervious area.
3. Other communities do not allow lots to exceed lot coverage or impervious area maximums.

As a result of this review of stormwater management in other communities, it is proposed that the thresholds that require a stormwater plan now apply differently to several zoning districts. This

change reflects differences in land use and development trends in each district. Additionally, due to this review and other staff findings described above, it is proposed that stormwater plans are required for all lots, with some exceptions.

Proposed Standards

Over the course of six Development Services Advisory Committee-Land Development Review (DSAC-LDR) Subcommittee meetings in 2016, staff collaborated with subcommittee members and stakeholders to review the current standards, identify goals for the amendment, and develop the standards included in this amendment. The following sections describe the changes proposed in this amendment.

Goals of the current amendment

Based on DSAC's 2013 input and the findings in the additional research outlined above, staff identified several goals for the current amendment:

- Eliminate the inequity of the current applicability thresholds.
- Provide better justification for the standards.
- Provide stormwater management for runoff on all lots.
- Create a program that is more predictable for property owners and increase communication between reviewers and applicants.

These goals are aimed at preventing detrimental impacts both on site and on adjacent properties and will apply stormwater management standards more fairly throughout the entire county.

Applicability

This amendment maintains the current applicability to all lots with single-family and two-family dwellings, and duplexes. The current exemption for lots with a permit from the SFWMD for surface water management or environment resource protection is maintained, however, an exemption is added for non-urban agriculturally zoned lots.

Stormwater plans are currently only required when the lot coverage or impervious area exceeds the thresholds in Table 6.05.01 F. This amendment removes Table 6.05.01 F and adds a requirement for one of two types of stormwater plans for all lots, based only on impervious area thresholds specific to each zoning district. The characteristics of each stormwater plan are described in more detail in Tables 1 and 2 above, and the following sections.

This change is made in response to staff's experience that drainage issues are not only associated with a high percentage of impervious area. Staff has found that due to updated building requirements, new construction is required to use more fill to build to a higher flood elevation than in the past. In these cases, the fill pad, slopes, and other site grading can have an impact on a neighborhood's drainage patterns even when the total impervious area is low. Therefore, a stormwater plan is necessary on all lots to ensure that drainage from new homes or additions does not create detrimental impacts on the subject property or adjacent properties. However, the requirements for stormwater plans for lots with low impervious area is designed to be less onerous than for lots with high impervious area. Therefore, a Type I Stormwater Plan is established for lots with relatively lower impervious areas and a Type II Stormwater Plan is established for properties

with high impervious areas to ensure stormwater runoff does not result in detrimental impacts on site or to adjacent properties.

Plan submittal

Property owners will continue to submit stormwater plans concurrently with a building permit, consistent with the current submittal requirements. The stormwater plan submittal process is also described in more detail in the proposed Administrative Code section in Appendix A.

Stormwater plan thresholds

The proposed amendment uses impervious area thresholds to determine whether a Type I or Type II Stormwater Plan is required. In urban areas, where lot sizes are typically small, the DSAC-LDR Subcommittee found that the current threshold for lots under 11,000 square feet is appropriate for the urban area and, based on staff's research, ensures that a majority of property owners in the urban area will not exceed the threshold. As a result, a Type I Stormwater Plan is required for lots with 40 percent or less impervious area and a Type II Stormwater Plan is required for lots with more than 40 percent impervious area.

On lots in Estates zoning districts, where the DSAC-LDR Subcommittee found that the current impervious area thresholds are disproportionately limiting, a Type I Stormwater Plan is required for lots with 25 percent or less impervious area and a Type II Stormwater Plan is required for lots with more than 25 percent impervious area. Currently many lots in the Estates are required to provide a stormwater plan with lot coverage and impervious areas of less than 10 percent. The DSAC-LDR Subcommittee reviewed staff's research and aerials of existing sites in the Estates and determined that lots with 25 percent or less impervious area represent appropriate impervious areas for Estates lots and should not require stormwater calculations.

On lots in RSF-1 zoning districts and Rural Agricultural (A) zoning in the urban areas, a Type I Stormwater Plan is required for lots with 30 percent or less impervious area and a Type II Stormwater Plan is required for lots with more than 30 percent impervious area. This threshold reflects that RSF-1 lots and Rural Agricultural (A) zoned lots in the urban areas are frequently larger than other typical urban lots and sometimes have unique infrastructure constraints.

Finally, lots that discharge directly into a waterbody downstream of the last control structure may submit a Type I Stormwater Plan regardless of the impervious area on the lot. These waterbodies are uncontrolled and tidally affected, therefore, discharges will not result in stormwater runoff impacts to neighboring properties. However, for lots discharging directly into a controlled waterbody, upstream of the last control structure, a Type II Stormwater Plan must be submitted, regardless of the impervious area on the lot. These discharges have the potential to impact neighboring properties or the stormwater system and require some retention or detention before discharging into the waterbody.

Criteria for Type I Stormwater Plans:

Lots required to submit a Type I Stormwater Plan have a comparatively lower percentage of impervious area. As a result, Type I Stormwater Plans are the least complex type of stormwater plan. These plans are required to demonstrate that stormwater will be directed to appropriate

locations without impacting neighboring properties. While on-site retention may be provided on lots with a Type I Stormwater Plan, no on-site retention is required.

The Type I Stormwater Plan criteria allow for a wide range of methods to address stormwater. On some sites, the stormwater plan may require more drainage infrastructure to direct stormwater to appropriate locations, while other sites may simply require grading of the site to meet the stormwater plan criteria. As a result, the amendment allows either a Florida registered design professional (such as architects, landscape architects, or engineers), a certified contractor, or owner builder to design the stormwater plan.

Type I Stormwater Plans are required to demonstrate:

- **The direction of stormwater discharges.** This criterion ensures that stormwater runoff is directed away from neighbors and allows stormwater runoff to discharge to one or more of the following:
 - An existing surface water management system.-
 - A drainage conveyance system, such as swales or underground storm sewer systems.
 - On-site retention or detention areas.
 - A waterbody downstream of the last control structure.
 - Outfalls to a waterbody must also demonstrate that they will not result in erosion of soil, and if an orifice is used, will be allowed through a minimum 3-inch orifice. Also, the soil adjacent to the discharge area shall be stabilized.
- **Compliance with several design standards.**
 - **Retaining wall setbacks.** To allow for maintenance of retaining walls, a six-inch setback from the property line is required.
 - **Retention calculations for French drains.** When French drains are used, a 40 percent void ratio shall be used in retention calculations.
 - **Stormwater pipe specifications.** If used, stormwater pipes shall not be metal. This standard is intended to prevent pipe installations with relatively short life spans.
 - **Gutter and downspout standards in 6.05.01 C.** This requirement ensures that downspouts are not pointed toward neighboring properties when a structure is located 10 feet or less from a property line. It should be noted additional requirements for downspouts can be found in Florida Statutes Chapter 381.0065(4)(s), which also requires that downspouts are directed away from the septic system drainfield, if one is located on the property.
- **The location, dimension, and setbacks of septic systems.** If a septic system is present or proposed on the property, this criteria ensures that the design and location of stormwater management and septic systems is coordinated throughout the development of the property.

Criteria for Type II Stormwater Plans:

Lots that are required to submit a Type II Stormwater Plan have comparatively higher percentages of impervious area and may require a more detailed design. These plans are also required to

demonstrate that stormwater will be directed to appropriate locations without impacting neighboring properties.

Due to the increased complexity of Type II Stormwater Plans and the requirement for volumetric calculations for a design storm, this amendment requires that Type II Stormwater Plans shall be designed by a professional engineer licensed in the state of Florida.

Type II Stormwater Plans are required to demonstrate:

- **Compliance with all Type I Stormwater Plan criteria.** The Type I Stormwater Plan criteria are designed to ensure stormwater runoff does not impact neighboring properties. These criteria also apply to Type II Stormwater Plans.
- **An engineer's analysis including:**
 - **Water quantity calculations for a 5-year, 1-day storm event** (the same design storm event used in the current standards). Retention for the storm event is required for the impervious area in excess of the thresholds for Type II Stormwater Plans only. The DSAC-LDR Subcommittee determined that this storm event provides adequate protection when applied to the area exceeding impervious area thresholds. There is no requirement for water quality calculations included in this standard.
 - **A matrix of all required separation distances.** This requirement will ensure that the location of wells, drainfield systems, and stormwater retention or detention areas are coordinated.
- **Certification of Compliance.** The engineer is required to submit a certification of compliance prior to inspections. Stormwater plans will be inspected during the 800 series inspections for building permits. This is the same process used to inspect current stormwater plans.

Application requirements

Application requirements for stormwater plans are established in the Administrative Code and are designed to ensure that staff is provided with enough information to determine that appropriate methods are used to direct discharge off site or to retain water on site.

Inspection and maintenance

The proposed amendment identifies an inspection schedule and maintenance requirements for stormwater plans. Stormwater plans will be submitted with the building permit and will be inspected by the County at the time of the building permit inspections and prior to the issuance of a certificate of occupancy or certificate of completion, as applicable. Once approved, the property owner is responsible for maintaining the site grading and drainage (such as the swales, French drains, grates, etc.) in accordance with the approved stormwater plan. Since some types of site work and impervious surfaces are not required to obtain a permit, this section also notifies property owners that changes to the property, whether or not a permit is required, shall not modify the site in a manner that will prevent the site from continuing to drain in accordance with the approved stormwater plans.

Violations

The amendment also proposes to establish stormwater plans as the tool for demonstrating compliance with Collier County Code of Laws and Ordinances section 90-41 (f)(8) which states:

“...Subsequent to the construction of a single-family residence on the respective lot (parcel of land), it shall be a violation of this article to cause ‘additional surface water’ to run onto any real property owned by another landowner by filling, grading or otherwise raising the elevation of the respective water source single family residence lot...”

Staff is frequently called upon to investigate stormwater management issues on lots that were developed prior to the establishment of the stormwater plan requirements. These types of violations occur for a number of reasons including the addition of fill or slopes near the property line. Therefore, this change will ensure that property owners and staff have a method to demonstrate compliance with the Code of Laws.

DSAC-LDR SUBCOMMITTEE RECOMMENDATIONS: No changes, approved unanimously on November 29, 2016.

DSAC RECOMMENDATIONS: No changes, approved unanimously on December 7, 2016.

PLANNING COMMISSION RECOMMENDATIONS: No changes, approved unanimously on January 30, 2017.

FISCAL & OPERATIONAL IMPACTS: There are no anticipated fiscal or operational impacts associated with this amendment.

RELATED CODES OR REGULATIONS:

Collier County Code of Laws and Ordinances section 90-41 (f)(8)
Florida Statutes Chapter 381.0065(4)(s)

GROWTH MANAGEMENT PLAN IMPACT: There are no anticipated Growth Management Plan impacts associated with this amendment.

OTHER NOTES/VERSION DATE: Prepared by Jeremy Frantz, Senior Planner, 12/1/16.

Amend the LDC as follows:

1 **6.05.01 Water Management Requirements**

2 A complete stormwater management system shall be provided for all areas within the
3 **subdivision** or **development**, including **lots**, **streets**, and **alleys**.

4 A. The system design shall meet the applicable provisions of the current County codes and
5 ordinances, SFWMD rules and regulations pursuant to Florida Statutes, and the Florida
6 Administrative Code, and any other affected state and federal agencies' rules and
7 regulations in effect at the time of preliminary **subdivision** plat submission. Water
8 management areas will be required to be maintained in perpetuity according to the

- 1 approved plans. Water management areas not maintained will be corrected according to
 2 approved plans within 30 days.
- 3 B. Where stormwater runoff from outside the **subdivision** or **development** historically
 4 passes on, over, or through areas of the **subdivision** or **development**, such runoff shall
 5 be included in the stormwater system design. The system shall be designed for long life,
 6 low cost maintenance by normal methods and provide for optimal on-site detention of
 7 stormwater runoff and groundwater recharge in accordance with applicable County and
 8 SFWMD regulations.
- 9 C. Any **structure** with an outside wall which is closer than 10 feet from a side property line
 10 shall install properly sized (minimum twenty-four-square inch cross-section) gutters and
 11 downspouts to direct stormwater away from neighboring properties and toward front
 12 and/or rear swales or retention/detention areas.
- 13 D. In-ground percolation type retention systems such as rock trenches, exfiltration trenches
 14 or beds, infiltrator type systems, gallery type systems, etc., shall not be used to achieve
 15 water quality retention for residential **subdivisions**. Rear **yard** open retention systems
 16 shall likewise not be designed to achieve water quality retention on projects submitted
 17 after January 1, 2002. All retention systems for projects designed after January 1, 2002,
 18 shall be on common property owned and maintained by a homeowners' association or
 19 similar entity.
- 20 E. Any canal which forms a part of the public water management system shall be dedicated
 21 for care and maintenance per the requirements of the governmental agency which has
 22 jurisdiction. Canals located entirely within the **subdivision** and which do not form a part
 23 of the public water management system shall be dedicated to the public, without the
 24 responsibility for maintenance, as a drainage **easement**. A maintenance **easement**, of a
 25 size acceptable to the County Manager or designee or other governmental agency with
 26 maintenance responsibility, shall be provided **adjacent** to the established drainage
 27 **easement**, or the drainage **easement** created must be of a size suitable for the
 28 proposed canal and its maintenance.
- 29 ~~F. Stormwater Retention/Detention Design for **Single-Family Dwelling Units, Two-Family**~~
 30 ~~**Dwelling Units and Duplexes.**~~
- 31 ~~1. Applicability. Any application for a building permit to allow the **development** or~~
 32 ~~redevelopment of a **single-family** or **two-family dwelling** or **duplex** submitted~~
 33 ~~after July 1, 2008, except for the following conditions:~~
- 34 ~~a. Any application within the boundaries of **development** projects that have:~~
 35 ~~(1) been permitted by the South Florida Water Management District for~~
 36 ~~Surface Water Management or Environmental Resource Protection and~~
 37 ~~(2) have a central surface water management collection, storage,~~
 38 ~~treatment and discharge system;~~
- 39 ~~b. A one-time addition is allowed for certain sized homes, as set forth below;~~
 40 ~~or~~
- 41 ~~c. An application accompanied by a stormwater management plan, signed~~
 42 ~~and sealed by a registered Florida Professional Engineer.~~

43 Table 6.05.01 F.

Lot Size	Lot Coverage	Impervious Area Coverage
Under 11,000 sq. ft.	25%	40%
11,000 sq. ft. to 52,999 sq. ft. and 100 ft. or greater in width	2,750 sq. ft. +5% of area in excess of 11,000 sq. ft.	4,400 sq. ft. +5% of area in excess of 11,000 sq. ft.
11,000 sq. ft. to 52,999 sq. ft. and less than 100 ft. in width	2,750 sq. ft. +2% of area in excess of 11,000 sq. ft.	4,400 sq. ft. +2% of area in excess of 11,000 sq. ft.

53,000 sq. ft. and over	4,850 sq. ft. +3% of area in excess of 53,000 sq. ft.	6,500 sq. ft. +2% of area in excess of 53,000 sq. ft.
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- 2. ~~The maximum allowable ratio of lot coverage and impervious area coverage to the total lot area shall be as provided for in Table 6.05.01 F. unless accompanied by an engineer's analysis as specified below.~~
 - a. ~~The site drainage analysis shall include water quality calculations to SFWMD standards and water quantity calculations done to accommodate the runoff, from area in excess of the above ratio, from a 5-year 1-day storm and shall include a percolation test done by a qualified engineer or technician. If the site will use a drainfield/septic tank for sewage treatment/disposal, the wet season water table calculations for drainage must match that used for the drainfield design.~~
 - b. ~~The application site plan shall list all required separation distances between wells, drainfield systems, and stormwater retention/detention areas. The calculations may be done on the site plan or may be in a separate Engineer's report, but must be signed and sealed by the Engineer.~~
 - c. ~~The water surface area of swimming pools and ponds is not considered as impervious area for the purposes of the calculations in Table 6.05.01 F.~~
- 3. ~~A one-time addition to an existing residence will be allowed after July 1, 2008. The addition will be limited to 3 percent of the lot area up to a maximum of 1,000 square feet as long as that one-time addition does not exceed the area in Table 6.05.01 F. by more than 3 percent of the lot area or more than 1,000 square feet.~~

- GF. The design of the stormwater management system shall fully incorporate the requirements of the Interim Watershed Management regulations of LDC section 3.07.00.
- HG. **Street grades.** **Street grades** must be determined in relation to the **drainage facilities** for the **subdivision** and must not exceed four percent nor be less than 0.3 percent, unless otherwise approved by the County Manager or designee pursuant to section 10.02.04 of the LDC. **Street grades** must be shown on the **development plans** by direction and percent of fall on the road profiles.
- H. Rainfall and runoff criteria. The system must be designed for "design **floods**" resulting from rain storms and antecedent conditions for all system components in accordance with current Collier County and South Florida Water Management District criteria.
 - 1. Runoff coefficients. Existing land usage will be considered for the selection of proper runoff coefficients within the drainage basins involved, whether within the **subdivision** or **development** or not.
 - 2. Lakes. Artificial lakes and retention basins proposed as part of a stormwater retention system for on-site water management must be designed and shall be consistent with other ordinances or regulations of Collier County, the state or the region. All lakes will be set back from **abutting** roadways or intersections pursuant to the design standards established in sections 22-106 through 22-119 of the Code of Laws and Ordinances.
- J. Stormwater outfalls. Stormwater runoff must be conducted to positive outfalls that can be permanently maintained, practicably and legally. Outfalls to existing waterways, canals, preserve or conservation areas, lakes or storm sewers will be acceptable provided it can be demonstrated through a professional engineering study to the County Manager or designee that such receiving systems have adequate capacity to receive the proposed quantity and quality of the additional flow.

- 1 1. Side ditches or swales along public or private roads shall not be accepted as
2 suitable positive outfalls except as may be specifically accepted under the
3 provisions of the LDC by the County Manager or designee and by the Florida
4 Department of Transportation, if applicable. The storage of stormwater runoff in
5 other existing or proposed ditches or swales within a public or private **right-of-**
6 **way** will be permitted for volume storage when approved under South Florida
7 Water Management District design criteria, but will not be utilized to satisfy the
8 stormwater storage (quality) requirements of a **development's** master water
9 management system.
- 10 ~~KJ.~~ Major waterway. Improvement or establishment of major waterways and canals will be
11 developed in full accord with applicable stormwater management criteria. Engineering
12 data, criteria, and suitable calculations shall be submitted to the County Manager or
13 designee prior to approval of construction plans.
- 14 1. Roadways over major waterways will be **structures** approved by the County
15 Manager or designee, sized to maintain flow capacity, designed to assure long
16 life and minimal maintenance. Construction must meet all current Florida
17 Department of Transportation Standard Specifications for Road and Bridge
18 Construction, as amended, unless otherwise approved by the County Manager or
19 designee pursuant to section 10.02.04 of the LDC.
- 20 ~~EK.~~ Outfall ditches and open channels. Unless otherwise approved by the County Manager
21 or designee pursuant to section 10.02.04 of the LDC, side slopes no steeper than four to
22 one will be allowed. Protection against scour and erosion will be provided as required by
23 the County Manager or designee.
- 24 ~~ML.~~ Roadside swales.
- 25 1. Design. In the interest of preserving the existing natural groundwater levels,
26 roadways will not be designed so as to cause the significant lowering of the water
27 levels existing in the area prior to **development**. Roadside swales and ditches
28 may be permitted within **street rights-of-way** where the use of roadside swales
29 can be justified to the County Manager or designee through a written report
30 prepared by the **applicant's** professional engineer. Swales, where permissible,
31 will have side slopes no steeper than four to one and they will not be utilized to
32 satisfy the stormwater quality (volume) requirements of a project's master water
33 management system. Where flow velocities in excess of four feet per second are
34 anticipated, urban **right-of-way** sections will be required.
- 35 2. Erosion protection. All unpaved areas within the permanent **right-of-way** must
36 be provided with permanent erosion protection, such as **native vegetation** or
37 turf. Swale ditches shall be sodded a lateral distance extending from the road
38 pavement to the top of the swale ditch backslope. Where valley guttered sections
39 are used for drainageways, turf protection must be placed from the edge of the
40 gutter to the outer limits of the **right-of-way**. If seeding is utilized, then mulching
41 in accordance with the Florida Department of Transportation standards will be
42 required. Additionally, if seeding and mulching are utilized, then a strip of sod one
43 foot wide will be placed along the face of the pavement or curb section and over
44 the invert of any approved swale section within the runoff **flowway**. All swales
45 subject to erosion velocities will have adequate erosion protection in the form of
46 riprap or other applicable like methods.
- 47 3. **Driveways** across swale ditches. **Driveways** across permitted swale ditches
48 must have placed beneath them drainage pipes of adequate size and type
49 approved by the County Manager or designee, based on the capacity
50 requirements calculated by the **applicant's** professional engineer for the
51 **development's** master water management system.

1 AM. **Street** drainage. **Street** drainage within the road **right-of-way** through grassed swales
2 will be permitted for rural cross sections only except where velocities in excess of four
3 feet per second are anticipated. The flow from these swales or other types of **drainage**
4 **facilities** will be diverted to natural percolation areas, artificial seepage basins or
5 artificial lakes of at least sufficient capacity to comply with the criteria of Collier County
6 and the South Florida Water Management District. Other equally effective methods of
7 returning cleansed waters to the **aquifer** will be acceptable upon prior review and
8 approval by the County Manager or designee.

9 1. Existing natural lakes may be used as detention areas provided that they have
10 adequate storage capacity and that pretreatment measures approved by the
11 County Manager or designee are taken to prevent pollutant matter from entering
12 the lake. Positive outfall **drainage facilities** will be provided away from all
13 percolation areas, seepage basins, detention areas and artificial lakes to handle
14 the runoff from storms which exceed the required design storm event in duration
15 and/or severity.

16 ON. Percolation areas. The actual area required will depend on the percolation rate for the
17 soils at the specific site and the manner in which the site is developed in accordance
18 with Collier County and South Florida Water Management District criteria.

- 19 1. Underground drainage. Where drainage plans provide for, or it is so directed by
20 the County Manager or designee, the collection of stormwater in underground
21 pipes, inlets and other appurtenances for conveyance to an intermediate or
22 ultimate outfall, the following minimum design criteria will be observed:
- 23 a. The minimum pipe used within a publicly maintained stormwater
24 collection system will be 15 inches in diameter.
 - 25 b. Inlets will be spaced at such intervals and in such a manner to allow for
26 the acceptance of 100 percent of the ten-year, one-hour storm runoff.
 - 27 c. The distance between terminating and intermediate **structures** must not
28 exceed those required by the Florida Department of Transportation,
29 pursuant to Florida Department of Transportation Drainage Manual,
30 Volumes 1—4 (1987 edition or latest revision).
 - 31 d. The stormwater, underground collection system, must be so designed
32 that the elevation of the hydraulic gradient during a ten-year, one-hour
33 storm event is never higher than the crown elevation of any publicly
34 maintained roadway in the system.
 - 35 e. The pipes must be designed to minimize sediment deposits.
 - 36 f. The pipe materials must meet the requirements set forth in sections
37 943—948 inclusive of the current edition of the Florida Department of
38 Transportation Standard Specifications for Road and Bridge Construction.
39 Only concrete pipe or other pipe materials approved by the County
40 Manager or designee may be used in tidal or salt waters.
 - 41 g. All drainage pipes must be fitted with headwalls, endwalls, inlets and
42 other appropriate terminating and intermediate **structures**.

43 PO. Stormwater disposal. The method of ultimate disposal of stormwaters will be dependent
44 upon the soil characteristic underlying the **development** or **subdivision**. All stormwaters
45 will be subjected to treatment for the removal of petroleum residues, oils, suspended
46 solids and other pollutants found in stormwater runoff. The method of treatment will be
47 determined by the **applicant's** professional engineer responsible for the preparation of
48 the stormwater management plans and specifications, and will be subject to the approval
49 of the County Manager or designee and the concerned state agencies.

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1 **6.05.03 Stormwater Plans for Single-Family Dwelling Units, Two-Family Dwelling Units,**
2 **and Duplexes**

3 A. Purpose. The purpose of this section is to manage stormwater runoff on **lots** with
4 **single-family dwelling units, two-family dwelling units, or duplexes** in order to
5 prevent detrimental impacts on site or to **adjacent** properties. This section is also
6 designed to provide criteria for demonstrating compliance with Collier County Code of
7 Laws and Ordinances section 90-41(f)(8). For the purposes of this section, the term
8 **impervious area** shall include roofed **buildings**, concrete and asphalt pads, cool deck
9 (e.g. spraycrete), pavers with limerock base, swimming pools, and lined pond area.
10 Additionally, the term **pervious area** shall include grass, crushed stone (e.g. #57),
11 mulch, pavers without limerock base, and unlined pond area.

12 B. Applicability. A Type I or Type II Stormwater Plan shall be required for **lots** with **single-**
13 **family dwellings, two-family dwellings, or duplexes** with the following exceptions:

14 1. **Lots** located in the Rural Agricultural (A) zoning district outside the Immokalee
15 Urban Area Overlay district and outside the coastal urban designated area as
16 established in the Future Land Use Map.

17 2. **Lots** that have received a Surface Water Management or Environmental
18 Resource Protection permit from the South Florida Water Management District.

19 C. Stormwater plan submittal. A stormwater plan shall be submitted as part of an
20 application for a **building** permit for any of the following:

21 1. Type I Stormwater Plans.

22 a. New **structures**, additions, pools, or decks on **lots** with 40 percent or
23 less **impervious area**, or as described in the following zoning districts:

24 i. RSF-1 zoned **lots** with 30 percent or less **impervious area**.

25 ii. Rural Agricultural (A) zoned **lots** within the Immokalee Urban Area
26 Overlay district or within the coastal urban designated area as
27 established in the Future Land Use Map with 30 percent or less
28 **impervious area**.

29 iii. Estates zoned **lots** with 25 percent or less **impervious area**.

30 b. New **structures**, additions, pools, or decks on **lots** that discharge directly
31 to a waterbody downstream of the last control structure, whether or not
32 the **lot** exceeds the **impervious area** thresholds in LDC section 6.05.03
33 C.1.a above.

34 2. Type II Stormwater Plans.

35 a. New **structures**, additions, pools, or decks on **lots** with more than 40
36 percent **impervious area**, or as described in the following zoning
37 districts:

38 i. RSF-1 zoned **lots** with more than 30 percent **impervious area**.

39 ii. Rural Agricultural (A) zoned **lots** within the Immokalee Urban Area
40 Overlay district or within the coastal urban designated area as
41 established in the Future Land Use Map with more than 30
42 percent **impervious area**.

43 iii. Estates zoned **lots** with more than 25 percent **impervious area**.

44 b. New **structures**, additions, pools, or decks on **lots** that discharge directly
45 to a waterbody upstream of the last control structure, whether or not the
46 **lot** exceeds the **impervious area** thresholds in LDC section 6.05.03
47 C.2.a above.

48 D. Stormwater plan criteria.

49 1. Type I Stormwater Plan. Type I Stormwater Plans shall be prepared by a Florida
50 registered design professional, licensed contractor or owner builder. The Type I
51 Stormwater Plan shall demonstrate the following:

- 1 a. Stormwater runoff. Discharges from the impacted area shall be directed
2 into one or more of the following:
3 i. An existing surface water management system.
4 ii. A drainage conveyance system, such as swales or underground
5 storm sewer systems.
6 iii. On-site retention or detention areas. The bottom of retention or
7 detention areas shall be above the wet season water table.
8 iv. A waterbody downstream of the last control structure. Stormwater
9 discharges to a waterbody shall not result in erosion of soil.
10 Discharges may be allowed through an orifice with a minimum
11 size of 3 inches and the soil **adjacent** to the discharge area shall
12 be stabilized. For **lots** discharging directly to waterbodies
13 upstream of the last control structure, see LDC section 6.05.03
14 D.2.
- 15 b. Design standards.
16 i. Retaining walls shall be set back six inches from the property line,
17 if applicable.
18 ii. Stone in French drains shall be calculated with a 40 percent void
19 ratio, if applicable.
20 iii. Stormwater pipes, if used, shall not be metal.
21 iv. Gutters and downspouts shall comply with LDC section 6.05.01 C,
22 if applicable.
- 23 c. The location, dimension, and **setbacks** of septic systems, if applicable.
- 24 2. Type II Stormwater Plan. Type II Stormwater Plans shall be prepared by a
25 professional engineer licensed in the state of Florida. The Type II Stormwater
26 Plan shall demonstrate the following:
- 27 a. Stormwater runoff. Discharges from the impacted area shall be directed
28 into one or more of the following:
29 i. An existing surface water management system.
30 ii. A drainage conveyance system, such as swales or underground
31 storm sewer systems.
32 iii. On-site retention or detention areas. The bottom of retention or
33 detention areas shall be above the wet season water table.
34 iv. A waterbody. Stormwater discharges directly to a waterbody shall
35 not result in erosion of soil. Discharges may be allowed through
36 an orifice with a minimum size of 3 inches and the soil **adjacent** to
37 the discharge area shall be stabilized.
- 38 b. Design standards.
39 i. Retaining walls shall be set back six inches from the property line,
40 if applicable.
41 ii. Stone in French drains shall be calculated with a 40 percent void
42 ratio, if applicable.
43 iii. Stormwater pipes, if used, shall not be metal.
44 iv. Gutters and downspouts shall comply with LDC section 6.05.01 C,
45 if applicable.
- 46 c. The location, dimension, and **setbacks** of septic systems, if applicable.
- 47 d. An engineer's analysis that demonstrates the following:
48 i. Water quantity calculations by a qualified engineer or technician
49 that demonstrate the ability to accommodate the runoff from the
50 area exceeding the applicable threshold in LDC section 6.05.03 C
51 from a 5-year 1-day storm.

- 1 ii. A matrix of all required separation distances between wells,
- 2 drainfield systems, and stormwater retention/detention areas. The
- 3 calculations may be done on the site plan or may be in a separate
- 4 engineer's report, but the site plan must be signed and sealed by
- 5 a professional engineer licensed in the state of Florida.
- 6 e. A certification of compliance shall be submitted to the County by the
- 7 engineer prior to an inspection.
- 8 E. Application submittal requirements. The Administrative Code shall establish the
- 9 submittal requirements for stormwater plans.
- 10 F. Inspection and maintenance.
- 11 1. Inspection. The subject property shall be inspected by the County prior to
- 12 issuance of a certificate of occupancy or certificate of completion, as applicable,
- 13 for consistency with the approved stormwater plan.
- 14 2. Maintenance. The property owner shall maintain site grading and drainage (e.g.
- 15 swales, French drains, grates, etc.) in accordance with the approved stormwater
- 16 plan. Future changes to **impervious area** or site grading shall not modify the site
- 17 in a manner that will prevent continued drainage of the site as shown on the
- 18 approved stormwater plan, whether or not a permit is required for an
- 19 improvement.
- 20 G. Violations. Where a violation of Collier County Code of Laws and Ordinances section 90-
- 21 41(f)(8) has been found by the Code Enforcement Board or Special Magistrate, a
- 22 stormwater plan shall be submitted that demonstrates the additional flow of surface
- 23 water has been eliminated. The subject property shall be inspected by the County to
- 24 determine if the violation has been resolved.
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